CLAIMS:

1. A method of monitoring status of a system component in a process chamber of a batch type processing system, comprising:

exposing a system component of the batch type processing system to light from a light source; and

monitoring interaction of the light with the system component to determine a status of the system component.

2. The method according to claim 1, wherein the exposing comprises:

exposing a system component that is transparent to the light.

3. The method according to claim 1, wherein the exposing comprises:

exposing at least one of a process tube, a shield, a ring, a baffle, and a liner to the light.

4. The method according to claim 1, wherein the exposing comprises:

exposing a system component including a ceramic material to the light.

5. The method according to claim 1, wherein the exposing comprises:

exposing a system component including at least one of an oxide, a nitride, and a carbide to the light.

6. The method according to claim 1, wherein the exposing comprises:

exposing a system component including at least one of quartz, Al_2O_3, SiN, and SiC to the light.

7. The method according to claim 1, wherein the exposing comprises:

exposing a system component having a material deposit to the light.

8. The method according to claim 1, wherein the exposing comprises:

exposing a system component having a material deposit to the light, the material deposit containing at least one of Si, SiGe, SiN, SiO_2, doped Si, HfO_2, $HfSiO_x$, ZrO_2, and $ZrSiO_x$.

9. The method according to claim 1, wherein the exposing comprises:

using a laser, a LED, a lamp, or a heater for the light source.

10. The method according to claim 1, wherein the exposing comprises:

exposing a system component to light from a light source positioned outside a chamber processing zone.

11. The method according to claim 1, wherein the exposing comprises:

exposing a system component to light from a light source positioned inside a chamber processing zone.

12. The method according to claim 1, wherein the exposing comprises:

exposing a system component to light having a single wavelength or to light having multiple wavelengths.

13. The method according to claim 1, further comprising:

performing a process in the process chamber.

14. The method according to claim 13, wherein the performing comprises:

performing at least one of thermal process and a plasma process.

15. The method according to claim 13, wherein the performing comprises:

performing at least one of a chamber cleaning process, a chamber conditioning process, a substrate etching process, and a substrate film formation process.

16. The method according to claim 13, wherein the performing comprises:

flowing a process gas including a halogen-containing gas during a chamber cleaning process.

17. The method according to claim 13, wherein the performing comprises:

flowing a process gas including at least one of ClF_3, F_2, NF_3, and HF during a chamber cleaning process.

18. The method according to claim 13, wherein the performing comprises:

flowing a process gas including at least one of a silicon-containing gas and a nitrogen-containing gas during a chamber conditioning process.

19. The method according to claim 13, wherein the performing comprises:

flowing a process gas including at least one of DCS and NH_3 during a chamber conditioning process.

20. The method according to claim 13, wherein the performing comprises:

flowing a process gas including a halogen-containing gas during a substrate etching process.

21. The method according to claim 13, wherein the performing comprises:

flowing a process gas including HF during a substrate etching process.

22. The method according to claim 13, wherein the performing comprises:

flowing a process gas including at least one of a silicon-containing gas and an nitrogen-containing gas during a substrate film formation process.

23. The method according to claim 13, wherein the performing comprises:

flowing a process gas including at least one of NO and TEOS during a substrate film formation process.

24. The method according to claim 13, wherein the performing comprises:

flowing a process gas including a metal-containing gas during a substrate film formation process.

25. The method according to claim 13, wherein the performing further comprises:

flowing an inert gas including at least one of Ar, He, Ne , Kr, Xe, and N_2.

26. The method according to claim 13, wherein the performing comprises:

exposing a system component to a temperature between about 100°C and about 1000°C.

27. The method according to claim 13, wherein the performing comprises:

exposing a system component to a pressure between about 10 mTorr and about 760 Torr.

28. The method according to claim 13, wherein the performing comprises:

exposing a quartz system component to chamber pressure of about 200 mTorr and a temperature of about 300°C during a chamber cleaning process.

29. The method according to claim 1, wherein the exposing comprises:

exposing a quartz system component including a SiN protective coating and a metal oxide material deposit to the light during a chamber cleaning process.

30. The method according to claim 1, wherein the monitoring comprises:

using an optical monitoring system to detect intensity of light transmission from the system component.

31. The method according to claim 30, wherein the monitoring further comprises:

determining if an intensity level of the light transmission from the system component has reached a threshold value.

32. The method according to claim 31, wherein the monitoring further comprises:

measuring the intensity level of the light transmission component to arrive at a determination of whether to stop the process.

33. The method according to claim 1, wherein the monitoring comprises:

using an optical monitoring system to detect intensity of light reflection from the system component.

34. The method according to claim 33, wherein the monitoring further comprises:

determining if an intensity level of the light reflection has reached a threshold value.

35. The method according to claim 34, wherein the monitoring further comprises:

measuring the intensity level of the light reflection to arrive at a determination of whether to stop the process.

36. The method according to claim 1, further comprising:

forming a protective coating on a system component.

37. The method according to claim 36, wherein the forming a protective coating comprises:

forming at least one of SiN, SiC, SiO_2, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, DyO_3, SiO_2, MgO, Al_2O_3, ZnO, SnO_2, and In_2O_3.

38. The method according to Claim 1, wherein the monitoring comprises:

using an optical monitoring system to detect said interaction of the light; and

purging optical components of said monitoring system with a purge gas.

39. A computer readable medium containing program instructions for execution on a processor, which when executed by the processor, cause a batch substrate processing apparatus to perform the steps of:

exposing a system component of the batch type processing system to light from a light source; and

monitoring interaction of the light with the system component to determine a status of the system component.

40. A system for monitoring status of a system component, comprising:

means for exposing light to a system component in a process chamber; and

means for monitoring interaction of light with the system component to determine a status of the system component.

41. A batch type processing system, comprising:

a process chamber configured to perform a process;

a system component;

a light source configured to expose the system component to light;

an optical monitoring system configured to monitor interaction of the light with the system component to determine a status of the system component; and

a controller configured to control the processing system

42. The processing system according to claim 41, wherein the processing system comprises:

at least one of a thermal processing system, a plasma processing system, a chemical vapor deposition system, and an atomic layer deposition system.

43. The processing system according to claim 41, wherein the system component comprises:

at least one of a process tube, a shield, a ring, a baffle, and a liner.

44. The processing system according to claim 41, wherein the system component comprises a ceramic material.

45. The processing system according to claim 41, wherein the system component comprises:

at least one of an oxide, a nitride, and a carbide.

46. The processing system according to claim 41, wherein the system component comprises:

at least one of quartz, Al2O3, SiN, and SiC.

47. The processing system according to claim 41, wherein the system component further comprises a protective coating.

48. The processing system according to claim 41, wherein the system component further comprises a material deposit.

49. The processing system according to claim 41, wherein the system component further comprises a material deposit containing at least one of Si, SiGe, SiN, SiO2, doped Si, HfO2, HfSiOx, ZrO2, and ZrSiOx.

50. The processing system according to claim 41, wherein the optical monitoring system comprises:

at least one of an optical detector to detect light transmission from the system component and an optical detector to detect light reflection from the system component.

51. The processing system according to claim 41, wherein the light source is positioned at least one of inside and outside a chamber processing zone.

52. The processing system according to claim 41, wherein the light source comprises at least one of a laser, a LED, a lamp, and a heater.

53. The processing system according to claim 41, wherein the light source provides at least one of a light having a single wavelength and a light having multiple wavelengths.

54. The processing system according to claim 41, further comprising:
a gas injection system configured to introduce a process gas in the process chamber.

55. The processing system according to claim 41, wherein the gas injection system is configured to introduce a process gas for performing at least one of a chamber cleaning process, a chamber conditioning process, a substrate etching process, and a substrate film formation process.

56. A processing system, comprising:

a process chamber configured to perform a process;

a system component;

a light source configured to expose the system component to light;

an optical monitoring system configured to monitor transmission and/or reflection of light from the system component, wherein the optical monitoring system is further configured to determine if an intensity level of the light transmission and/or light reflection has reached a threshold value, and based on the determination, at least one of continue with and stop the process; and

a controller configured to control the processing system.